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ONCOLOGIC
DUODENOPANCREATECTOMY *

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I HAVE come to speak candidly about a debated subject on which I have been working for many years; this makes me feel confident of your kind understanding, since it has been said that "the law of human life is effort, and the law of human judgement is mercy."¹

I see how difficult it is, on biological and psychological grounds, to delve into the subject of aggressive oncologic surgery. There are several stumbling-blocks. The two most important are the development of new biological concepts in the surgical management of cancer and surgical conformism.

New biological concepts have brought into question the value of block resection, at least in some sites such as the breast. However, the survey held in Florence at the Eleventh International Cancer Congress of the International Union Against Cancer on October 20 to 27, 1974 showed that surgery stands its ground. I shall mention some facts which may assuage the surgeon's doubt. Regional lymph nodes

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ADEQUATE ONCOLOGIC SURGERY: THREEFOLD AXIOLOGICAL VALUE

- 1) Biological criterion
Clinicopathological and immunobiological
 - 2) Tactical criterion
Anatomico-embryological
Technical (oncological asepsis)
Physiopathological (rehabilitation)
 - 3) Philosophical criterion
Optimism
Self-confidence
-

play an important role in immunologic reactivity to neoplastic growth; removal of a primary tumor may reduce the potential of spread and surgical trauma may favor the development of metastases from circulating tumor cells. Incomplete excision carries the hazard of uncontrollable enhancement of metastatic activity. In summary, surgery still remains the most effective curative modality for cancer. There is a need for interdisciplinary approaches such as adjuvant chemotherapy applied to patients with minimal disease whose major primary tumor mass has been removed.

Surgical conformism, the second stumbling block, is associated with feelings of resignation and a lack of commitment on the part of physicians. Surgeons may be skeptical about the undertaking and results of operation. They may become inclined to a quick and inadequate performance or they may be reluctant to perform super-radical resection.

Oncological surgery is based on axiological values. We have evolved our criteria under three headings—biological, tactical, and philosophical (see accompanying table).² The biological criterion leads us to choose a pattern of resection which forms an oncologic surgical unit. The tactical criterion is related to surgical strategy. The philosophical criterion concerns man as a person, not as a thing, and the human factors which compel the surgeon to make the most suitable decision—to do or not to do. However, it behooves the surgeon to move with the same proficiency in either palliation or cure.

Under surgical strategy, I should like to emphasize the anatomico-embryological criterion for its impact on oncologic surgery of the upper digestive tract. Knowledge of cleavage and of the so-called zygotic planes equip the surgeon for isolation of the dorsal gut mesentery and,

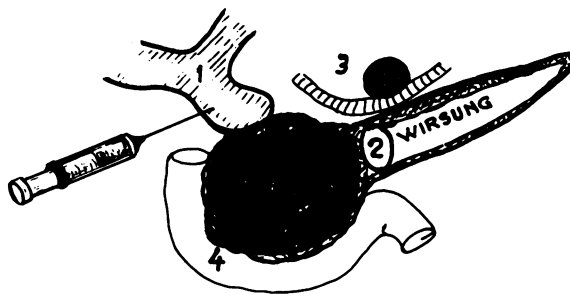


Fig. 1. Cancer of the head of the pancreas. Pathologic morphology: 1 = Dilated common duct, traction to the left and stenosis at the pancreatic level is the typical cholangiographic picture. 2 = Dilated duct of Wirsung, nearly 20 mm. diameter; sclerosing pancreatitis. 3 = Node in the hepatic artery, positive in this case. 4 = Tumor of the head, 8 cm. diameter, invasion of the uncinate process and duodenum. Life expectancy after duodenopancreatectomy is no more than nine months.

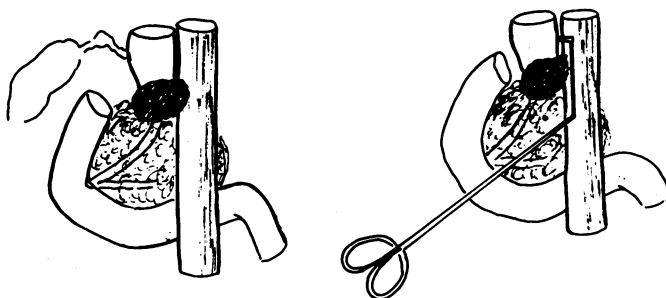


Fig. 2. Patient who underwent duodenopancreatectomy for small cancer of the head of the pancreas. Figure on left: tumor less than 2 cm. diameter adherent to the portal vein in a short extension. The tumor is located at the upper end of the retrovascular pancreas. Figure on right: Satsinsky clamps to remove a small portion of the portal vein.

moreover, enables him to resect vascular pedicles and to clear away all regional lymphatics through zones of safety.

In the upper abdomen the duodenopancreatic complex (DPC)—an anatomico-embryological, physiological, clinical, and therapeutic unit—is placed over the celiac region or “posterior abdominal mediastinum,” which contains the aorta, the inferior vena cava, the solar plexus, and the cisterna chyli. The DPC represents the visceral content of this region, lying astride the portomesenteric axis, covering the posterior “mediastinum,” and constituting by itself an “anterior mediastinum” for surgical action. The dorsal mesentery of the foregut and midgut has its insertion at the aorta and contains the celiac and upper mesenteric



Fig. 3. Carcinoma of the head of the pancreas. Supraselective angiogram of the gastroduodenal artery.

trunks, hidden partly or totally by the pancreas. Couinaud has shown how to reach these structures easily by vertical incision of the pancreas in its medial line. The path into the posterior mediastinum is thus opened and exeresis can be effected through zygotic planes.

By oncologic duodenopancreatectomy (ODP) we understand the removal of the DPC for tactical purposes in surgery of the upper digestive tract. The problem is often that of a composite oncological surgical unit, in which cephalic duodenopancreatectomy is only a part of the key procedure for coping with the lymphatic or regional extension of a tumor. The procedure of ODP goes beyond the limits of the lesion encompassing the periampullary region and the head of the pancreas, which obviously require that strategy. In addition, it involves all tumors arising from the foregut or midgut, which have their lymphatic drainage at this crossroad. ODP is the resection pattern for dealing with tumors of the gastric antrum, extrahepatic biliary tree, first jejunal loop, and preduodenal colon. The combined ODP performed in cases without jaundice has several tactical advantages and drawbacks. The advantages are: 1) in the absence of jaundice the mortality is apt to be lower and the risk of hepatorenal postoperative syndrome is reduced; 2) dissection of the portomesenteric axis is easier because the primary tumor is far from that vital structure and in many cases resection of the uncinate process of the pancreas can be avoided. The drawbacks are: 1) The procedure is a combined operation, with multiple visceral resections and increased risk of tactical or technical error. 2) Several anastomoses are necessary and the undilated bile-duct system is difficult to use in anastomoses. The normal distal pancreas in the absence of sclerosing pancreatitis cannot take sutures well, and the development of stenosis or fistula is favored. 3) The period of postoperative recovery is lengthened and may be complicated by anemia, hypoproteinemia, hypokalemia, or fistula.

Since 1955, when performing the Whipple operation we have used Child's reconstructive procedure. The surgeon should be versatile in order to cope with the various hazards that account for the high mortality rate, which in our experience reaches 20%. If operative mortality could be brought down to less than 5%, the operation would become a routine additional procedure for all the tumors mentioned above.

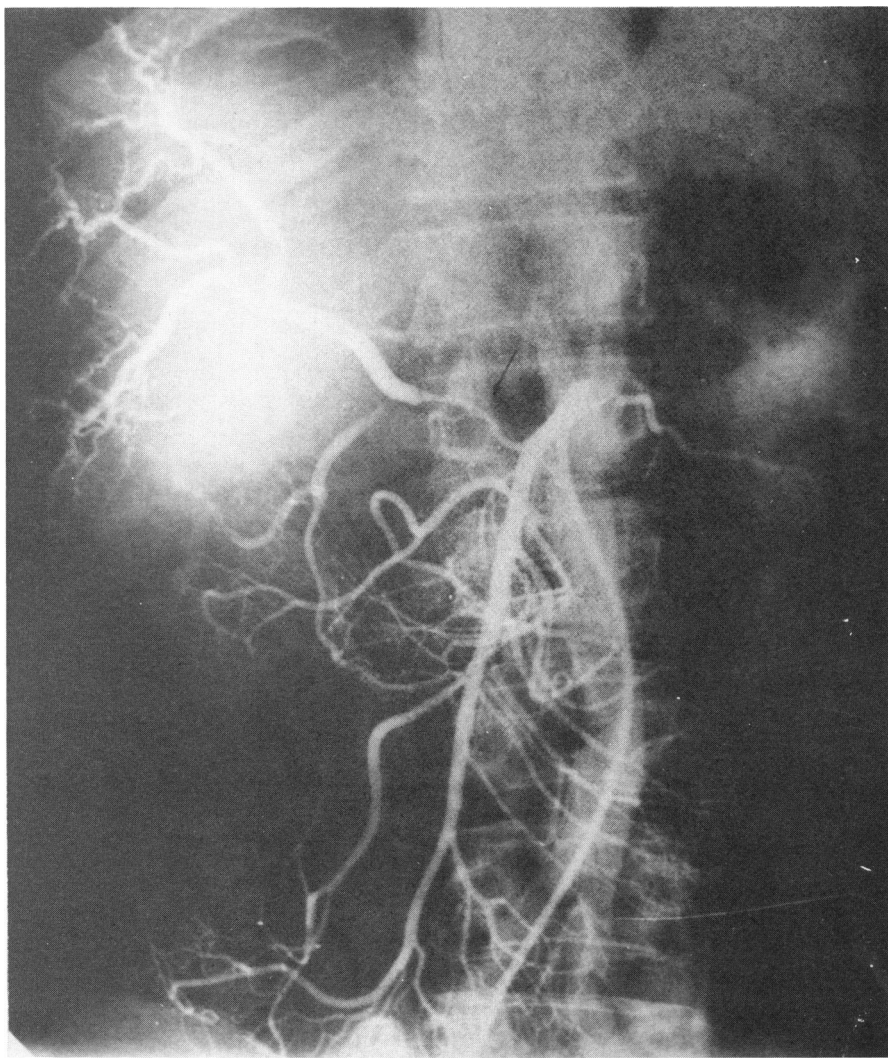


Fig. 4. Carcinoma of the head of the pancreas; same patient as in Figure 5. The main hepatic artery is given off by the superior mesenteric artery and shows elongation and narrowing.

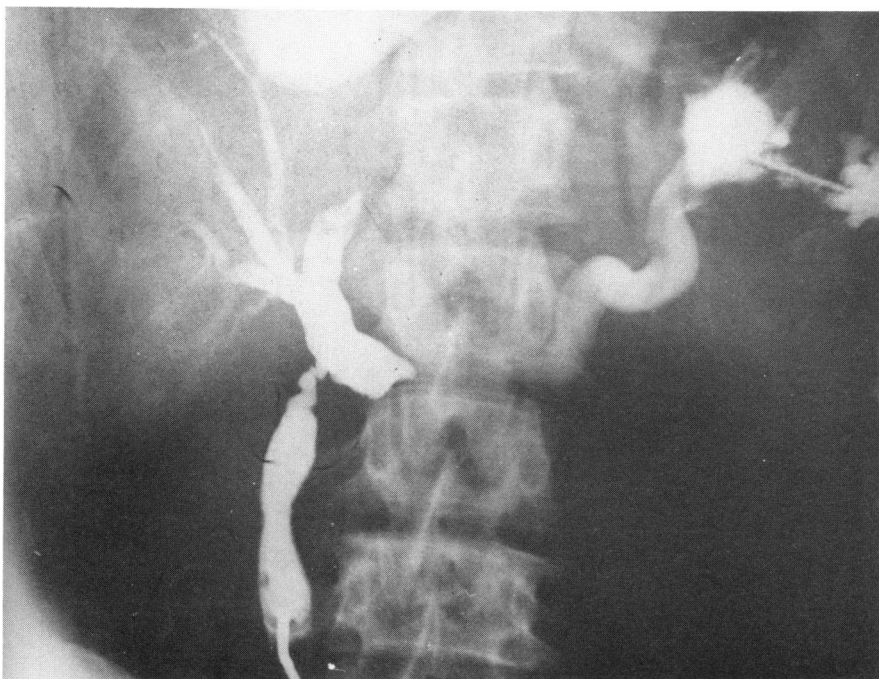


Fig. 5. Carcinoma of the head of the pancreas. Simultaneous injection of portal vein and cholangiogram.

CANCER OF THE HEAD OF THE PANCREAS

Duodenopancreatectomy is not an adequate operation for cancer of the head of the pancreas. Oncologic surgery requires dissection or resection of the venous axis. Every cancer of the head, unless it is less than 2 cm. in diameter and is located very near the perampullary region, extends to the portal vein before it produces jaundice. It was stated by Evans and Oschner in 1954⁴ that a radical operation should include the portal vein.⁵ Recently an extensive regional ODP was reported by Forscher.⁶

In the majority of cases we encountered, the tumors were from 4 to 10 cm. in diameter (Figure 1). The end-results were the same as those published in a collective review in 1951.⁷ We attained a three-year survival rate of 6% (Figure 2).

Selective angiography has demonstrated that "every positive angiogram has occurred in patients in whom the tumor at operation had

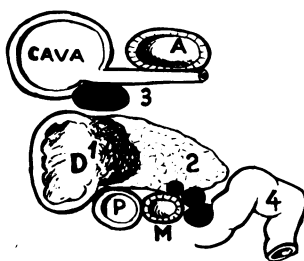


Fig. 6. Carcinoma of the ampulla of Vater. First operation (elsewhere) two years previously: cholecystojejunostomy performed because of jaundice. Patient was well until three months ago, when loss of weight and backache were experienced. Reoperation: wide "crater" at the ampulla (1), 5 cm. in diameter, making a unit with invasion of the retroportal pancreas (2). Metastatic nodes on the vena cava (3) and at the duodenojejunal junction (4). Adventitia of the mesenteric artery (M) infiltrated by tumor at the uncinate process. It was necessary to remove the transverse colon with the duodeno-pancreatic block.

progressed to inoperability,"⁸ in other words, "the tumor was not resectable in any of the instances in which an x-ray of the portal vein was abnormal."⁹ The next illustration (Figure 3) is from one of our inoperable cases. It shows a superselective angiogram of the gastroduodenal artery and amputation of this arterial trunk. The main hepatic artery (Figure 4) is given off by the superior mesentery artery; an elongated narrowing of its wall is shown. Simultaneous filling of the portal vein and cholangiography of the biliary tree (Figure 5) shows that the normal separation of 2 cm.⁹ between those two structures at the posterior head of the pancreas has disappeared.

AMPULLA OF VATER

There is no doubt that the Whipple operation is indicated for malignant tumors arising in the vicinity of the ampulla of vater and that duodenopancreatectomy is a true oncologic operation in those conditions, but I should like to offer a hint derived from personal experience. First, I agree with many authorities¹⁰ that duodenotomy and biopsy are rarely necessary and that their routine use lowers the long-term survival rate of patients in consequence of tumor implantation. Second, unfortunately, in many surgical departments duodenopancreatectomy is seldom performed, at least in Argentina, and only a few surgeons can manage this difficult procedure. Wide duodenotomies and short-circuit operations will lead, sooner or later, to recurrent disease. It is better to perform external biliary drainage as a first step¹⁶ and to leave the radical

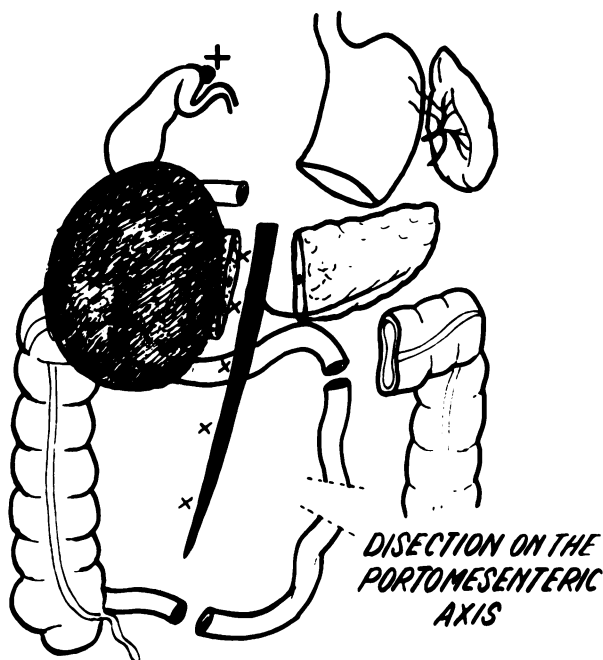


Fig. 7. Cancer of the predoduodenal colon. Group A (without extension to the duodeno-pancreatic complex [DPC]. Oncologic right hemicolectomy. Three cases. Results: good. Group B (with extension to the DPC). 1) Limited surgery of DPC. Five cases. Results: very poor. 2) Radical surgery of DPC. Six cases. Results: good.

operation for a second step or another surgeon. Figure 6 shows what often happens. A short-circuiting operation had been performed two years previously. Reoperation was performed for loss of weight and back pain; it revealed extension of the crater of the ampulla into the pancreas, metastatic nodes at the posterior mediastinum and duodeno-jejunal junction, and a lesion resectable as a composite surgical oncological unit which includes the right colon. The above-mentioned circumstances have yielded a five-year survival rate of only 20% for cancer of the ampulla.

Carcinoma of the duodenum, first jejunal loop, and cancer of the lower extrahepatic biliary tree are related to the pancreas and confirm the recognized necessity of ODP. Cancer of the gallbladder and middle part of the biliary extrahepatic tree are related to the portal vein and hepatic artery; lymphatic drainage goes primarily to the nodes along

the common bile duct.¹¹ Complete local eradication is insufficient and results have been disappointing. Routine ODP should be performed.

CARCINOMA OF THE GASTRIC ANTRUM

We are familiar with the poor long-term results obtained in cancer of the antropylic region. Involvement of the subpyloric glands is associated with a 6% five-year survival rate. Clearing away the lymphatic and cellular tissues around the hepatic pedicle and both faces of the duodenopancreas¹² has not improved our results. ODP as a composite operation is a rewarding procedure and should be performed more frequently in treating these tumors.

CANCER OF THE PREDUODENAL COLON

The right colon forms part of the primitive umbilical loop and its vascular and lymphatic drainage goes toward the portomesenteric axis and head of the pancreas. Moreover, the hepatocolonic loop or preduodenal colon lies directly on the DPC; this relation explains the ease with which the two viscera become adherent, infiltrated, or communicant. For these reasons ODP is considered a rational, adequate, and aggressive procedure for dealing with regional lymphatic spread and direct extension.

Figure 7 shows our experience in 14 cases of cancer of the preduodenal colon, 11 of them with extension to the DPC. Composite radical operations gave us good results in six of these cases.

In conclusion, I should like to stress the concept of an abdominal mediastinum and the fact that two of the three axiological values are established. Biosurgery should remove all the primary tumor mass or leave behind only minimal disease; this allows an interdisciplinary approach. Surgical strategy gives support to ODP. The psychological barrier of surgical conformism has not been broken completely. Surgeons should do their best to refer suitable patients to the radiotherapist, the chemotherapist, or the immunologist.

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